

PATENT COOPERATION TREATY

MULTI PAGE 1

04 APR. 2005

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

PCT

NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Rule 71.1)

To: Van Walstijn, B. Gerard VAN WALSTIJN, B., Gerard, G. Walstijn Intellectual Property ApS Parkovsvej 3 DK-2820 Gentofte DANEMARK		Date of mailing <i>(day/month/year)</i> 01.04.2005
Applicant's or agent's file reference 00128-PCT		IMPORTANT NOTIFICATION
International application No. PCT/EP 03/00607	International filing date <i>(day/month/year)</i> 22.01.2003	Priority date <i>(day/month/year)</i> 22.01.2003
Applicant NOKIA CORPORATION et al		

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.

2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.

3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

4. REMINDER

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

The applicant's attention is drawn to Article 33(5), which provides that the criteria of novelty, inventive step and industrial applicability described in Article 33(2) to (4) merely serve the purposes of international preliminary examination and that "any Contracting State may apply additional or different criteria for the purposes of deciding whether, in that State, the claimed inventions is patentable or not" (see also Article 27(5)). Such additional criteria may relate, for example, to exemptions from patentability, requirements for enabling disclosure, clarity and support for the claims.

Name and mailing address of the international preliminary examining authority: <div style="display: flex; align-items: center;"> <div> European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465 </div> </div>	Authorized Officer Schalinatus, D Tel. +49 89 2399-8242
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PATENT COOPERATION TREATY

PCT

REC'D 04 APR 2005

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

WIPO PCT

Applicant's or agent's file reference 00128-PCT	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/PEA/416)	
International application No. PCT/EP 03/00607	International filing date (day/month/year) 22.01.2003	Priority date (day/month/year) 22.01.2003
International Patent Classification (IPC) or both national classification and IPC H04N5/225		
Applicant NOKIA CORPORATION et al		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 6 sheets, including this cover sheet.

☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 12 sheets.

3. This report contains indications relating to the following items:

I ☒ Basis of the opinion

II ☐ Priority

III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability



IV ☒ Lack of unity of invention

V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

VI ☐ Certain documents cited

VII ☐ Certain defects in the international application

VIII ☐ Certain observations on the international application

Date of submission of the demand 13.08.2004	Date of completion of this report 01.04.2005
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer Glendinning, D Telephone No. +49 89 2399-2443 <div style="text-align: right;">  </div>

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No.

PCT/EP 03/00607

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17):*

Description, Pages

1, 4, 5, 7-28 as originally filed
2, 3, 6 received on 03.01.2005 with letter of 03.01.2005

Claims, Numbers

1-46 received on 03.01.2005 with letter of 03.01.2005

Drawings, Sheets

1/12-12/12 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
☐ the language of publication of the international application (under Rule 48.3(b)).
☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority in written form.
☐ furnished subsequently to this Authority in computer readable form.
☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
☒ the claims, Nos.: 47,48
☐ the drawings, sheets:

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. **PCT/EP 03/00607**

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

IV. Lack of unity of invention

1. In response to the invitation to restrict or pay additional fees, the applicant has:

- ☐ restricted the claims.
☐ paid additional fees.
☐ paid additional fees under protest.
☐ neither restricted nor paid additional fees.

2. ☒ This Authority found that the requirement of unity of invention is not complied with and chose, according to Rule 68.1, not to invite the applicant to restrict or pay additional fees.

3. This Authority considers that the requirement of unity of invention in accordance with Rules 13.1, 13.2 and 13.3 is

- ☐ complied with.
☒ not complied with for the following reasons:

see separate sheet

4. Consequently, the following parts of the international application were the subject of international preliminary examination in establishing this report:

- ☒ all parts.
☐ the parts relating to claims Nos. .

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-46
	No: Claims	
Inventive step (IS)	Yes: Claims	1-46
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-46
	No: Claims	

2. Citations and explanations

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/EP 03/00607

see separate sheet

IV Lack of unity of invention

- 1 Independent claims 1 and 34 are both directed to a hand-held device comprising a processor, a display, a user interface, a means for sensing motion of the hand-held device, and means for transforming the sensed motion into a signal suitable for controlling the hand-held device in some way. This subject matter common to claims 1 and 34 is known from

WO 01/86920

figure 1 of which clearly shows a hand-held device having a display and a user interface. The passage at lines 15-31 on page 5 clearly discloses using accelerometers or a camera to produce a signal indicative of movement of the hand-held device, and this signal is clearly used for controlling the hand-held device. Figure 6 shows the processor (602) of the hand-held device.

Apart from the above common features the features of claims 1 and 34 are quite distinct, claim 1 including a digital camera for producing images to be presented on the display, and claim 34 including a graphical user interface with objects and a cursor, whereby the signal indicative of motion is used to control movement of a cursor over the display. Claims 1 and 34 therefore fall to be considered as relating to two different inventions.

- 2 Independent claims 32 and 33 are considered to relate to the same invention as claim 1, though it may be that slight revision of both claims 32 and 33 is required to make quite clear that the images produced by the digital camera are intended to be presented on a display forming part of the hand-held device.
- 3 No great extra effort is required of the examiner in assessing the patentability of the claims relating to both inventions - this will therefore be done.

V Reasoned statement under Article 35(2)

- 1 First invention (claims 1-33)

- 1.1 Claim 1 requires that the digital camera produces images which are presented on the

display of the hand-held device, and the output signal of the camera is used to derive a signal indicative of movement of the hand-held device, this movement-indicative signal then being employed as user input for controlling the hand held device. There is prior art (e.g. WO 01/86920) disclosing a hand-held device including a camera which produces a movement-indicative signal used for controlling the hand-held device, but there is no prior art disclosing or suggesting the use of a camera (on a hand-held device) for producing both images for display and also movement-indicative signals used for controlling the hand-held device. The subject matter of claim 1 is thus considered to be new and to have inventive step.

- 1.2 The same conclusion holds for independent claims 32 and 33 as notionally amended for consistency with claim 1 (see IV. 2 above), and also for dependent claims 2-31.

2 Second invention

- 2.1 There is prior art, e.g. WO 01/86920, disclosing all the features of the first five lines of claim 34, but in the prior art the movement-indicative signal is used for scrolling the display or for achieving a zooming function. There is no disclosure or suggestion in the prior art of using a movement-indicative signal for causing movement of a cursor across the display. The subject matter of claim 34 is thus considered to be new and to have inventive step.

- 2.2 The same conclusion holds for dependent claims 35-46.

- 3 The claimed invention finds industrial applicability in the technical field of hand-held devices such as mobile telephones.

commands, e.g. changing the area viewed on the display screen or controlling the performance of a particular parameter associated with the device. Further, given the limited area available, not only on the display screen but also on the entire device, adding additional control keys, etc., is both difficult and burdensome to a user requiring two hand operation of the device.

US 6466198 discloses a system and method for view navigation and magnification of the display of hand-held devices in response to the orientation changes along only two axes of rotation as measured by sensors inside the devices. The view navigation system can be engaged and controlled by simultaneously pressing switches on both sides of the hand-held device. Miniature sensors like accelerometers, tilt sensors, or magneto-resistive direction sensors sense the orientation changes. These miniature sensors are presently not typically standard equipment for hand-held devices. Thus, such sensors add cost, use precious space and add weight.

20

The present invention is directed toward overcoming one or more of the above-identified problems.

DISCLOSURE OF THE INVENTION

25

On this background, it is an object of the present invention to provide a hand-held device of the kind referred to initially, which allows user input with the same hand that holds the device, without requiring the dedicated sensory equipment used by prior art hand-held devices.

30

This object is achieved in accordance with claim 1, by providing a hand-held device comprising: a processor, a display, a digital camera for capturing motion video or still images, means for presenting still images or motion video captured by said digital camera on said display; means for

35

transforming a signal from the camera into a motion signal indicative of the motion of the hand-held device; and a user interface in which motion of the hand-held device is - through the motion signal derived thereof - used as a user input to
5. control operation of the hand-held device.

Thus, by using a sensor that is available to start with in many hand-held devices -- namely a digital camera -- for a secondary use, namely creating a motion signal indicative of
10. the motion of the hand-held device, a hand-held device with motion sensing is provided in a economical and reliable manner.

The hand-held device may further comprise a user interface in
15. which motion of the hand-held device is - through the motion signal derived thereof - used as a user input.

The hand-held may further comprise a display, preferably a display suitable for displaying captured images.

20

Motion of a given type of the hand-held device can be used to manipulate images shown at least in part on the display, preferably by moving the images in a manner substantially corresponding to the movement of the hand-held device.

25

Different types of motion the hand-held device can e.g. be used to move, and/or zoom, and/or expand/collapse and/or rotate images displayed on the display.

30 Motion substantially parallel to the plane of the display of the hand-held device can be used to scroll an image displayed on the display. Motion substantially perpendicular to the plane of the display can be used to zoom an image displayed on the display. Rotational motion of the hand-held device can be
35 used to rotate an image displayed on the display.

interface, and the functionality of the second key can be associated with calling up a context-sensitive menu.

5 The selection of the object concerned can be performed by pressing and releasing the first key. Activation of the object concerned can be performed by pressing and releasing the first key twice in rapid succession. Moving or resizing of the object concerned can be performed by holding down the first
10 key while moving the hand-held device to move the cursor.

The first key and the second key can be softkeys, whereby the current functionality of the softkeys is shown in the display, preferably in dedicated fields of the display.

15 The first key can be placed below the display on the left side of the latter, preferably proximate to lower edge of the display, and the second key can be placed below the display on the right side of the latter, preferably proximate to lower
20 edge of the display.

It is another object of the present invention to provide an improved method for proving user input to hand-held devices. This object is achieved by providing a method for creating
25 user input for a hand-held device that has a processor, a user interface and a digital camera for capturing motion video or still images comprising the steps of: obtaining a camera signal, alternately using the camera signal to capture still images or motion video; or to determine motion of the hand-
30 held device from the camera signal; and using the determined motion of the hand-held device as an input for the user interface.

It is yet another object of the present invention to provide a
35 use of a digital camera of a hand-held device

CLAIMS:

1. A hand-held device comprising:

5 a processor;

a display;

10 a digital camera for capturing motion video or still images;

means for presenting still images or motion video captured by said digital camera on said display;

15 means for transforming a signal from the camera into a motion signal indicative of the motion of the hand-held device; and

20 a user interface in which motion of the hand-held device is - through the motion signal derived thereof - used as a user input to control operation of the hand-held device.

25 2. A hand-held device according to claim 1, in which motion of a given type of the hand-held device is used to manipulate images shown at least in part on the display, preferably by moving the images in a manner substantially corresponding to the movement of the hand-held device.

30 3. A hand-held device according to claim 2, in which a given type of motion the hand-held device is used to move, and/or zoom, and/or expand/collapse and/or rotate images displayed on the display.

35 4. A hand-held device according to claim 3, in which motion substantially parallel to the plane of the display of the

hand-held device is used to scroll an image displayed on the display, and/or motion substantially perpendicular to the plane of the display is used to zoom an image displayed on the display and/or rotational motion of the hand-held device is used to rotate an image displayed on the display.

5. A hand-held device according to any of claims 2 to 4, in which the images are images previously captured by the camera.

10 6. A hand-held device according to any of claims 2 to 5, in which movement of image is inverted with respect to motion of the hand-held device.

15 7. A hand-held device according to any of claims 1 to 6, in which the user interface comprises a graphical user interface, and wherein motion of the hand-held device is used as an input to the graphical user interface.

20 8. A hand-held device according to claim 2, in which motion of the hand-held device is used to manipulate an object displayed by the graphical user interface, preferably by moving the object in a manner substantially corresponding to the motion or to the inverted motion of the hand-held device, whereby the object displayed by the graphical user interface can be, an icon, a dialogue box, a window, a menu or a pointer.

25 9. A hand-held device according to claim 7, in which motion of a given type of the hand-held device is used to move, and/or zoom, and/or expand/collapse and/or rotate objects displayed by the graphical user interface.

30 10. A hand-held device according to claim 9, in which motion substantially parallel to the plane of the display of the hand-held device is used to scroll an object displayed by the graphical user interface, and/or motion substantially perpendicular to the plane of the display is used to zoom an

object displayed by the graphical user interface and/or rotational motion of the hand-held device is used to rotate an object displayed by the graphical user interface.

5 11. A hand-held device according to any of claims 1 to 10, in which the digital camera is detachable.

12. A hand-held device according to any of claims 1 to 11, in which the digital camera is movable relative to the hand-held
10 device.

13. A hand-held device according to any of claims 1 to 12, in which the means for transforming a signal from the camera into a motion signal derives the motion signal from changes between
15 succeeding images, or parts of succeeding images captured by the camera.

14. A hand-held device according to any of claims 1 to 13, in which the camera has an autofocus system, whereby the focusing
20 setting of the autofocus system is used for detecting movement in the camera direction.

15. A hand-held device according to any of claims 1 to 14, further comprising at least one key, wherein the functionality
25 of a motion type is dependent on the state of the at least one key.

16. A hand-held device according to any of claims 1 to 15, in which rotational motion of the hand-held device about an axis
30 substantially perpendicular to the display results in an inverse rotational movement of the image or graphical user interface object relative to the display, preferably in a manner such that the image or object is static with respect to the fixed coordinate system in which the hand-held device is
35 situated.

17. A hand-held device according to any of claims 1 to 16 in which the motion signal is used to adjust device settings, the device settings preferably comprising sound settings and display settings.

5

18. A hand-held device according to any of claims 7 to 17, further comprising a keypad with at least a first- and a second key and the graphical user interface comprises a cursor, whereby motion of the hand-held device is used to position the cursor over an object of the graphical user interface and primary functions associated with the object concerned are activated by pressing the first key and secondary functions associated with the object of the concerned are activated by pressing the second key.

15

19. A hand-held device according to claim 18, in which the functionality of the first key is associated with selection and activation of objects of the graphical user interface, and in which the functionality of the second key is preferably associated with calling up a context-sensitive menu.

20

20. A hand-held device according to claim 19, in which selection of the object concerned is performed by pressing and releasing the first key, and activation of the object concerned is preferably performed by pressing and releasing the first key twice in rapid succession.

25

21. A hand-held device according to claim 19 or 20, in which moving or resizing of the object concerned is performed by holding down the first key while moving the hand-held device to move the cursor.

30

22. A hand-held device according to any of claims 18 to 21, in which the first key and the second key are softkeys whereby the current functionality of the softkeys is shown in the display, preferably in dedicated fields of the display.

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23. A hand-held device according to claim 22, in which the first key is placed below the display on the left side of the latter, preferably proximate to lower edge of the display, and
5 the second key is placed below the display on the right side of the latter, preferably proximate to lower edge of the display.

24. A hand-held device according to any of claims 1 to 23,
10 further comprising at least one gravity based tilt sensor, and whereby the signal from the at least one tilt sensor is used in combination with the signal from the camera for creating the motion signal.

15 25. A hand-held device according to claim 24, wherein a tilt sensor is associated with the X-axis and/or a tilt sensor is associated with the Z-axis.

26. A hand-held device according to claim 25, wherein the
20 signal from the at least one tilt sensor is used to determine the absolute orientation of the handheld device relative to the direction of the gravitational pull.

27. A hand-held device according to any of claims 1 to 26,
25 further comprising means for sending the motion signal to another terminal via cable, infrared waves or radio frequency waves.

28. A system comprising a hand-held device according to claim
30 27 and a terminal capable of displaying imaginary three-dimensional objects on a two-dimensional screen, said terminal comprising means to change the orientation of the displayed object in response to signals received from the handheld device, whereby orientation changes of the hand-held device
35 are translated to corresponding orientation changes of the displayed object.

29. A system according to claim 28, in which position changes of the handheld device are translated to position changes of the displayed object.

5

30. A system comprising a hand-held device according to claim 27 and a terminal capable of displaying an imaginary three-dimensional space on a two-dimensional screen, said terminal comprising means to change the viewing position in the imaginary three-dimensional space in response to signals received from the handheld device, whereby positional changes of the hand-held device are translated to corresponding changes in the viewing position.

15 31. A system according to claim 28, in which orientation changes of the handheld device are translated into corresponding changes in the viewing direction in the imaginary three-dimensional space.

20 32. A method for creating user input for a hand-held device that has a processor, a user interface and a digital camera for capturing motion video or still images comprising the steps of:

obtaining a camera signal;

25 alternatingly using the camera signal to:

capture still images or motion video; or

to determine motion of the hand-held device from the camera signal; and to

30 use the determined motion of the hand-held device as an input for the user interface.

33. Use of a digital camera in a hand-held device for both capturing motion video or still images and for producing a motion signal indicative of motion of the hand-held device.

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34. A hand-held device comprising a processor, means for sensing motion of the hand-held device, a display, a keypad with at least a first- and a second key, a graphical user interface with objects and a cursor, and means for transforming the sensed motion of the handheld device into a signal suitable for moving the cursor over the display.

35. A hand-held device according to claim 34, in which motion of the hand-held device is used to position the cursor over an object of the graphical user interface and primary functions associated with the object concerned are activated by pressing the first key and secondary functions associated with the object concerned are activated by pressing the second key.

36. A hand-held device according to claim 35, in which the functionality of the first key is associated with selection and activation of objects of the graphical user interface, and in which the functionality of the second key is preferably associated with calling up a context-sensitive menu.

37. A hand-held device according to claim 36, in which selection of the object concerned is performed by pressing and releasing the first key, and activation of the object concerned is preferably performed by pressing and releasing the first key twice in rapid succession.

38. A hand-held device according to claim 36 or 37, in which moving or resizing of the object concerned is performed by holding down the first key while moving the hand-held device to move the cursor and the object concerned in unison therewith.

39. A hand-held device according to any of claims 34 to 38, in which the first key and the second key are softkeys whereby the current functionality of the softkeys is shown in the display, preferably in dedicated fields of the display.

40. A hand-held device according to claim 39, in which the first key is placed below the display on the left side of the latter, preferably proximate to lower edge of the display, and the second key is placed below the display on the right side of the latter, preferably proximate to lower edge of the display.

41. A hand-held device according to any of claims 34 to 40, in which said means for transforming motion of the handheld device into a signal suitable for moving the cursor over the display comprises a tilt sensor and/or an image capturing device and/or an accelerometer.

42. A hand-held device according to claim 41, in which said image capturing device is a motion video or still image digital camera.

43. A hand-held device according to any of claims 34 to 42, further comprising means to transform a signal from the camera and/or tilt sensor and/or accelerometer into a position signal for the cursor.

44. A hand-held device according to claim 43, in which said means for transforming a signal from the camera into a motion signal derives the motion signal from changes between succeeding images, or parts of succeeding images captured by the camera.

45. A hand-held device according to any of claims 42 to 44, in which the camera has an autofocus system, whereby the focusing setting of the autofocus system is used for detecting movement in the camera direction.

46. A hand-held device according to any of claims 34 to 45, in which the graphical user interface includes one or more of the

following object types: icons, dialogue boxes, windows, menus,
pointers.

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